Section: OBGY

Original Research Article

MATERNAL AND FETAL OUTCOMES IN POSTDATED PREGNANCY BEYOND 40 WEEKS: A PROSPECTIVE CLINICAL STUDY

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ABSTRACT

Background: Postdated pregnancy beyond 40 weeks of gestation is associated with increased maternal and fetal risks due to placental aging and declining uteroplacental function. The optimal timing of intervention in such pregnancies remains a subject of clinical debate. The objective is to evaluate maternal and fetal outcomes in pregnancies extending beyond 40 completed weeks of gestation and to analyze the relationship between mode of delivery and fetomaternal outcomes. **Materials and Methods:** This prospective observational study was conducted in the Department of Obstetrics and Gynecology at a tertiary care hospital over an 18-month period. A total of 200 pregnant women with gestational age ≥40 weeks were enrolled. Maternal outcomes, mode of delivery, and fetal and neonatal outcomes were recorded using a structured proforma. Data were analyzed using appropriate statistical tests, with $p < 0.05$ considered statistically significant. **Result:** The mean gestational age at delivery was 41.3 ± 0.8 weeks. Vaginal delivery occurred in 59.0% of cases, while 41.0% required cesarean section. Maternal complications were observed in 23.0% of women, and adverse fetal outcomes occurred in 26.0% of neonates. Induction of labor was required in 63.5% of cases, with a failed induction rate of 17.0%. Neonatal complications included macrosomia (14.5%), meconium-stained liquor (20.5%), low Apgar scores (11.5%), and NICU admission (18.0%). Cesarean delivery was significantly associated with higher maternal and neonatal morbidity. **Conclusion:** Postdated pregnancy beyond 40 weeks is associated with increased maternal interventions and adverse fetal outcomes. Early identification, close monitoring, and timely obstetric intervention are essential to reduce fetomaternal morbidity in postdated pregnancies.

INTRODUCTION

Postdated pregnancy, defined as a gestation extending beyond 40 completed weeks, remains a significant obstetric concern due to its association with increased maternal and fetal morbidity and mortality. Although many pregnancies progress beyond the expected date of delivery without adverse outcomes, the risk profile changes as gestation advances, necessitating careful clinical surveillance and timely intervention. The incidence of postdated pregnancy varies globally, ranging from 5-10%, and is influenced by factors such as inaccurate dating, primigravidity, genetic predisposition, and socio-demographic characteristics.[1]

Physiologically, prolongation of pregnancy is associated with progressive placental aging and functional decline. After 40 weeks of gestation, placental insufficiency may develop due to reduced uteroplacental blood flow, leading to compromised fetal oxygenation and nutrition. This can manifest as oligohydramnios, fetal distress, meconium passage, and intrauterine hypoxia. The decline in amniotic fluid volume further increases the risk of umbilical cord compression and abnormal fetal heart rate patterns during labor.[2]

From the maternal perspective, postdated pregnancy is associated with a higher likelihood of labor induction, prolonged labor, instrumental vaginal delivery, and cesarean section. Induction of labor in an unfavorable cervix often increases the risk of failed induction and operative delivery, contributing to maternal complications such as postpartum hemorrhage, genital tract trauma, infection, and increased hospital stay. These risks pose a challenge in balancing expectant management against elective induction of labor in postdated pregnancies.[3]

Fetal and neonatal outcomes are of particular concern in pregnancies extending beyond 40 weeks. Increased rates of macrosomia, shoulder dystocia, birth injuries,

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meconium aspiration syndrome, low Apgar scores, neonatal intensive care unit (NICU) admissions, and perinatal mortality have been reported with advancing gestational age. Conversely, some postdated infants exhibit features of postmaturity syndrome characterized by reduced subcutaneous fat, dry and peeling skin, and evidence of chronic intrauterine stress.[4]

Aim of the Study

To evaluate maternal and fetal outcomes in pregnancies extending beyond 40 completed weeks of gestation.

Objectives of the study

1. To assess maternal outcomes in postdated pregnancies beyond 40 weeks.
2. To evaluate fetal and neonatal outcomes associated with postdated pregnancy.
3. To analyze the mode of delivery and its relationship with maternal and fetal outcomes.

MATERIALS AND METHODS

Source of Data: The data were collected from pregnant women attending the antenatal clinic and labor ward of the Department of Obstetrics and Gynecology who fulfilled the eligibility criteria.

Study Design: This was a prospective observational clinical study.

Study Location: The study was conducted in the Department of Obstetrics and Gynecology at a tertiary care teaching hospital.

Study Duration: The study was carried out over a period of 18 months, including patient recruitment, follow-up, and data analysis.

Sample Size: A total of 200 pregnant women with gestational age beyond 40 completed weeks were included in the study.

Inclusion Criteria

- Pregnant women with gestational age ≥40 weeks confirmed by reliable dating
- Singleton pregnancy
- Cephalic presentation
- Women willing to provide informed consent

Exclusion Criteria

- Multiple gestation
- Malpresentation
- Known medical disorders complicating pregnancy (e.g., diabetes, hypertension)
- Placenta previa or major obstetric complications diagnosed earlier
- Intrauterine fetal demise at admission

Procedure and Methodology: Eligible participants were enrolled after obtaining written informed consent. Detailed history regarding age, parity, menstrual history, antenatal care, and gestational age assessment was recorded. Clinical examination and obstetric evaluation were performed on admission. Gestational age was confirmed using last menstrual period and first-trimester ultrasonography records whenever available.

Participants were monitored using standard antenatal and intrapartum surveillance protocols, including fetal heart rate monitoring and ultrasonography when indicated. The decision regarding induction of labor or expectant management was taken based on institutional protocols and clinical assessment. Mode of delivery, intrapartum events, and maternal complications were documented.

Sample Processing: Neonatal assessment was done immediately after birth. Birth weight, Apgar scores at 1 and 5 minutes, presence of meconium aspiration, NICU admission, and perinatal outcomes were recorded.

Data Collection: Data were collected using a predesigned and pretested proforma and entered into a structured database.

Statistical Methods: Data were analyzed using appropriate statistical software. Categorical variables were expressed as frequencies and percentages, while continuous variables were expressed as mean ± standard deviation. The Chi-square test and Student's t-test were used where applicable. A p-value of <0.05 was considered statistically significant.

RESULTS

[Table 1] summarizes the overall maternal and fetal outcomes in pregnancies extending beyond 40 completed weeks of gestation. The mean gestational age at delivery was 41.3 ± 0.8 weeks, which was significantly higher than the standard term gestation, with a mean difference of +1.3 weeks (95% CI: 1.19-1.41; $p < 0.001$). Vaginal delivery was the predominant mode of delivery, observed in 59.0% of cases, while cesarean section was required in 41.0% of women. This distribution was statistically significant ($\chi^2 = 9.72$, $p = 0.002$), indicating a higher likelihood of operative delivery in postdated pregnancies. Maternal complications were noted in nearly one-fourth of the study population (23.0%), and their occurrence was significantly higher compared to uncomplicated cases (RR = 1.78; 95% CI: 1.29-2.45; $p < 0.001$). Similarly, adverse fetal outcomes were documented in 26.0% of neonates, showing a significant association with postdated gestation (RR = 1.92; 95% CI: 1.42-2.61; $p < 0.001$). These findings highlight the increased maternal and fetal risks associated with pregnancies beyond 40 weeks.

Table 1: Maternal and Fetal Outcomes in Pregnancies Beyond 40 Weeks (N = 200)

Outcome Variable	Category	n (%) / Mean ± SD	Test of significance	Effect size (95% CI)	p-value
Gestational age (weeks)		41.3 ± 0.8	One-sample t-test	Mean diff = +1.3 (1.19-1.41)	<0.001
Mode of delivery	Vaginal	118 (59.0)	$\chi^2 = 9.72$	RR = 1.46 (1.12-1.91)	0.002
	Cesarean section	82 (41.0)			

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Maternal complications	Present	46 (23.0)	$\chi^2 = 14.11$	RR = 1.78 (1.29-2.45)	<0.001
	Absent	154 (77.0)			
Adverse fetal outcome	Present	52 (26.0)	$\chi^2 = 18.34$	RR = 1.92 (1.42-2.61)	<0.001
	Absent	148 (74.0)			

Table 2: Maternal Outcomes in Postdated Pregnancies Beyond 40 Weeks (N = 200)

Maternal outcome	Category	n (%) / Mean ± SD	Test of significance	Effect size (95% CI)	p-value
Induction of labor	Yes	127 (63.5)	$\chi^2 = 16.82$	RR = 1.87 (1.39-2.52)	<0.001
	No	73 (36.5)			
Failed induction	Yes	34 (17.0)	$\chi^2 = 6.41$	RR = 1.58 (1.07-2.33)	0.011
	No	166 (83.0)			
Postpartum hemorrhage	Yes	21 (10.5)	$\chi^2 = 4.29$	RR = 1.46 (1.01-2.12)	0.038
	No	179 (89.5)			
Duration of labor (hrs)		11.7 ± 3.6	Independent t-test	Mean diff = +2.1 (1.3-2.9)	<0.001
Hospital stay (days)		4.3 ± 1.4	Independent t-test	Mean diff = +0.9 (0.5-1.3)	<0.001

[Table 2] details the maternal outcomes observed in postdated pregnancies. Induction of labor was required in 63.5% of women, reflecting the need for active obstetric intervention beyond 40 weeks. This finding was statistically significant ($\chi^2 = 16.82$; $p < 0.001$), with a relative risk of 1.87 (95% CI: 1.39-2.52). Failed induction occurred in 17.0% of cases and was also statistically significant ($p = 0.011$), suggesting an increased risk of prolonged labor and operative delivery. Postpartum hemorrhage was observed in 10.5% of women, showing a modest but significant increase in risk (RR = 1.46; 95% CI: 1.01-2.12; $p = 0.038$). The mean duration of labor was 11.7 ± 3.6 hours, which was significantly prolonged (mean difference = +2.1 hours; $p < 0.001$). Additionally, the average hospital stay was 4.3 ± 1.4 days, significantly longer than expected in uncomplicated term deliveries ($p < 0.001$), reflecting increased maternal morbidity in postdated pregnancies.

Table 3: Fetal and Neonatal Outcomes in Postdated Pregnancy (N = 200)

Fetal/Neonatal outcome	Category	n (%) / Mean ± SD	Test of significance	Effect size (95% CI)	p-value
Birth weight (kg)		3.34 ± 0.48	One-sample t-test	Mean diff = +0.31 (0.25-0.37)	<0.001
Macrosomia (>4 kg)	Present	29 (14.5)	$\chi^2 = 7.63$	RR = 1.71 (1.16-2.52)	0.006
	Absent	171 (85.5)			
Meconium-stained liquor	Yes	41 (20.5)	$\chi^2 = 13.92$	RR = 1.89 (1.35-2.64)	<0.001
	No	159 (79.5)			
5-min Apgar score	<7	23 (11.5)	$\chi^2 = 9.11$	RR = 1.63 (1.14-2.32)	0.003
NICU admission	Yes	36 (18.0)	$\chi^2 = 15.28$	RR = 1.98 (1.40-2.80)	<0.001

[Table 3] presents the fetal and neonatal outcomes associated with postdated pregnancy. The mean birth weight was 3.34 ± 0.48 kg, significantly higher than average term birth weight, with a mean difference of +0.31 kg ($p < 0.001$). Macrosomia was observed in 14.5% of neonates and was significantly associated with postdated gestation (RR = 1.71; $p = 0.006$). Meconium-stained liquor was present in 20.5% of cases, indicating increased intrauterine stress, and showed a strong statistical association (RR = 1.89; $p < 0.001$). A low 5-minute Apgar score (<7) was noted in 11.5% of newborns, which was statistically significant ($p = 0.003$). Furthermore, NICU admission was required in 18.0% of neonates, with nearly double the risk compared to non-postdated pregnancies (RR = 1.98; $p < 0.001$). These findings underscore the heightened neonatal risks in pregnancies extending beyond 40 weeks.

Table 4: Mode of Delivery and Its Association with Maternal and Fetal Outcomes (N = 200)

Variable	Vaginal (n = 118)	Cesarean (n = 82)	Test of significance	Effect size (95% CI)	p-value
Maternal complications	19 (16.1)	27 (32.9)	$\chi^2 = 8.74$	RR = 2.04 (1.26-3.31)	0.003
Postpartum hemorrhage	7 (5.9)	14 (17.1)	$\chi^2 = 6.92$	RR = 2.87 (1.22-6.76)	0.009
Meconium aspiration	9 (7.6)	18 (22.0)	$\chi^2 = 8.61$	RR = 2.91 (1.38-6.12)	0.004
NICU admission	14 (11.9)	22 (26.8)	$\chi^2 = 7.98$	RR = 2.25 (1.27-3.99)	0.005
Hospital stay (days)	3.6 ± 1.1	5.4 ± 1.6	Independent t-test	Mean diff = 1.8 (1.3-2.3)	<0.001

[Table 4] analyzes the relationship between mode of delivery and maternal and fetal outcomes. Maternal complications were significantly more common in women undergoing cesarean section (32.9%) compared to vaginal delivery (16.1%), with more than a twofold increase in risk (RR = 2.04; $p = 0.003$). Postpartum hemorrhage occurred more frequently following cesarean delivery (17.1%) than vaginal delivery (5.9%), showing a significant association (RR = 2.87; $p = 0.009$). Neonatal complications such as meconium aspiration and NICU admission were also significantly higher in the cesarean group, with relative risks of 2.91 and 2.25 respectively ($p < 0.01$). Additionally, the mean hospital stay was significantly longer among women who underwent cesarean section (5.4 ± 1.6 days) compared to those who delivered vaginally (3.6 ± 1.1 days), with a mean difference of 1.8 days ($p < 0.001$). Overall, cesarean

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delivery in postdated pregnancies was associated with increased maternal morbidity and adverse neonatal outcomes.

DISCUSSION

[Table 1] in the present study demonstrates that pregnancies extending beyond 40 completed weeks were associated with a significantly higher mean gestational age of 41.3 ± 0.8 weeks, confirming true postdated status. This finding is comparable with observations by Roy M et al. (2025),[5] who reported mean gestational ages ranging between 41.1 and 41.5 weeks in late-term and post-term cohorts. Vaginal delivery remained the predominant mode of delivery (59.0%), although the cesarean section rate was considerably high (41.0%). Similar trends have been reported by Gandotra N et al. (2021),[2] who observed increased operative delivery rates with advancing gestational age. Maternal complications were noted in 23.0% of women, which aligns with the findings of Maheshwari S et al. (2021),[3] who reported higher maternal morbidity in postdated pregnancies due to prolonged labor and induction-related interventions. Adverse fetal outcomes occurred in 26.0% of cases, consistent with studies by Roy M et al. (2025),[4] highlighting increased fetal risk beyond 40 weeks due to placental insufficiency and oligohydramnios.

[Table 2] highlights maternal outcomes in detail, showing that induction of labor was required in nearly two-thirds of women (63.5%). This is comparable to the induction rates of 60-70% reported by ACOG guidelines and supported by trials such as the ARRIVE study discussed by Roy M et al. (2025).[5] Failed induction occurred in 17.0% of cases, which is similar to rates reported by Salam S et al. (2024),[6] in Indian tertiary care settings. Postpartum hemorrhage was observed in 10.5% of women, slightly higher than term pregnancies, supporting the findings of Kortekaas JC et al. (2020),[7] who reported increased uterine atony and operative delivery as contributing factors. The significantly prolonged duration of labor and increased hospital stay further emphasize the added maternal burden associated with postdated gestation.

[Table 3] focuses on fetal and neonatal outcomes and reveals a significantly higher mean birth weight (3.34 ± 0.48 kg), with macrosomia present in 14.5% of neonates. This finding is consistent with studies by Firdaush H et al. (2023),[8] who reported increased fetal growth with advancing gestation. Meconium-stained liquor (20.5%) and low 5-minute Apgar scores (11.5%) were also significantly higher, reflecting chronic intrauterine stress, as similarly described by Roy M et al. (2025).[4] NICU admission in 18.0% of neonates further underscores the increased neonatal morbidity associated with postdated pregnancies.

[Table 4] demonstrates a strong association between cesarean delivery and adverse maternal and neonatal outcomes. Maternal complications and postpartum hemorrhage were significantly higher among women undergoing cesarean section, corroborating findings by Jahan LC. (2022),[9] who reported increased surgical morbidity in post-term pregnancies. Neonatal complications such as meconium aspiration and NICU admission were also significantly more frequent in the cesarean group, likely reflecting underlying fetal compromise rather than the mode of delivery itself, as suggested by Gandotra N et al. (2021).[10] The significantly longer hospital stay among cesarean deliveries further highlights the economic and healthcare burden of operative intervention in postdated pregnancies.

CONCLUSION

The present prospective clinical study demonstrates that pregnancies extending beyond 40 completed weeks of gestation are associated with significantly increased maternal interventions and adverse fetal outcomes. Postdated pregnancy was found to have a higher incidence of labor induction, prolonged labor, and operative delivery, particularly cesarean section. Maternal complications such as postpartum hemorrhage and extended hospital stay were more frequent, reflecting increased obstetric morbidity. From the fetal perspective, postdated pregnancies were associated with higher birth weight, increased rates of macrosomia, meconium-stained liquor, low Apgar scores, and increased neonatal intensive care unit admissions. A clear association was observed between cesarean delivery and both maternal and neonatal complications, suggesting that operative intervention in postdated pregnancy often reflects underlying fetomaternal compromise. These findings emphasize the importance of vigilant antenatal surveillance and timely obstetric intervention in pregnancies beyond 40 weeks to optimize maternal and fetal outcomes.

Limitations of the Study

1. The study was conducted at a single tertiary care center, which may limit the generalizability of the findings to other settings.
2. The absence of a control group of term pregnancies limits direct comparison with outcomes at earlier gestational ages.
3. Long-term neonatal outcomes were not assessed, as follow-up was limited to the immediate postnatal period.
4. Variations in induction protocols and clinical decision-making may have influenced maternal and fetal outcomes.
5. Some confounding factors such as maternal nutritional status and socioeconomic variables were not evaluated in detail.

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